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Request for Continued Examination (RCE) Transmittal

Address to:
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Application Number	10/533,579
Filing Date	February 6, 2007
First Named Inventor	Stuart Arthur BATEMAN
Art Unit	1793
Examiner Name	A. Abu-Ali
Attorney Docket Number	622624-8

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☑ Enclosed

      i. ☑ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☐ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   a. ☑ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of 3 months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

   a. ☑ The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 12-0425 .

      i. ☑ RCE fee required under 37 CFR 1.17(e)

      ii. ☑ Extension of time fee (37 CFR 1.136 and 1.17)

      iii. ☑ Other Fee for suspension of action for 3 months

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature		Date	March 28, 2011
Name (Print/Type)	John Richards	Registration No.	31,053

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Stuart Arthur BATEMAN, et al.

Serial No.: 10/533,579 Group No. 1793

Filed: February 6, 2007 Examiner: S. Abu-Ali

For: FIRE RESISTANT MATERIAL

Attorney Docket No.: 622624-8

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION ACCOMPANYING REQUEST FOR CONTINUED EXAMINATION

This submission accompanies a request for continued examination and request for three months delay in prosecution. A final rejection was issued on November 30, 2010.. Please charge deposit account 12-0425 the sum of $130 for a one month extension of term for response.

The Claims commence on page 2.

Remarks commence on page 12.

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*

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I hereby certify that, on the date shown below, this correspondence is being:

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Date: March 25, 2011

Signature

John Richards

(type or print name of person certifying)

The listing of claims presented below replaces all prior versions and listing of claims in the application.

Listing of claims:

1. (Previously presented) An inorganic-organic hybrid (IOH) which comprises:
(i) an expandable or swellable layered inorganic component which is naturally occurring or a synthetic analogue of a polysilicate having a platelet thickness less than 5 nanometers and an aspect ratio greater than 10:1; and
(ii) an organic component including at least one ionic organic component and one or more neutral organic components which are intercalated between and/or associated with the layer(s) of the inorganic component in which the neutral organic component is a neutral derivative of a nitrogen based molecule and the ionic organic component is an ionic derivative of a triazine-based molecule,
the ionic or neutral organic components being capable of decomposing or subliming endothermically, and/or releasing volatiles with low combustibility on decomposition and/or inducing charring of organic species during thermal decomposition or combustion.

2. (original) An IOH according to claim 1, in which the inorganic component is rendered positively or negatively charged due to isomorphic substitution of elements within the layers.

3. (Canceled)

4. (canceled)

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5. (Currently amended) An ~~IOR~~ IOH according to claim1, in which the naturally occurring or synthetic analogue of a phyllosilicate is a smectite clay.

6. (original) An IOH according to claim 5, in which the smectite clay is selected from montmorillonite, nontronite, beidellite, volkonskoite, hectorite, bentonite, saponite, sauconite, magadiite, kenyaite, laponite, vermiculite, synthetic micromica and synthetic hectorite.

7. (previously presented) An IOH according to claim 1, in which the naturally occurring phyllosilicate is selected from bentonite, montmorillonite and hectorite.

8. (Canceled)

9. (Currently amended) An ~~IOR~~ IOH according to claim [[8]] 1, in which the aspect ratio is greater than about 50:1.

10. (previously presented) An IOH according to claim1, in which the aspect ratio is greater than about 100: 1.

11. (previously presented) An IOH according to claim 1, in which the inorganic component includes intedayer or exchangeable metal cations to balance the charge.

12. (original) An IOH according to claim 11, in which the metal cation is selected from an alkali metal and alkali earth metal.

13. (original) An IOH according to claim 12, in which the alkali or alkali earth metal is selected from Na^+, K^+, Mg^{2+} and Ca^{2+}.

14. (previously presented) An IOH according to claim 11, in which the cation exchange capacity of the inorganic component is less than about 400 milli-equivalents per 100 grams.

15. (previously presented) An IOH according to claim 11, in which the ionic organic component is exchanged with the exchangeable metal ions of the inorganic component.

16. (Canceled) .

17. (canceled)

18. (Canceled)

19. (Previously presented) An IOH according to claim 1, in which the neutral derivative of a nitrogen based molecule is a triazine based species.

20. (Previously presented) An IOH according to claim 1 in which the triazine based species is selected from melamine, triphenyl melamine, melam (l,3,5-triazine-2,4,6-triamine-n-(4,6-diamino-l,3,5- triazine-yl)), melem ((-2,5,8-triamino-l,3,4,6,7,9,9b-heptaazaphenalene)), melon (poly {8-amino-I,3,4,6, 7,9,9b-heptaazaphenalene-2,5diyl)imino}), bis and triaziridinyltriazine, trimethylsilyltriazine, melamine cyanurate, melamine phthalate, melamine phosphate, melamine phosphite, melamine phthalimide, dimelamine phosphate, phosphazines, low molecular weight polymers with triazine and phosphazine repeat units and isocyanuric acid and salts or derivatives thereof.

21. (original) An IOH according to claim 20, in which isocyanuric acid and salts or derivatives thereof are selected from isocyanuric acid, cyanuric acid, triethyl cyanurate, melamine cyanurate, trigylcidylcyanurate, triallyl isocyanurate, trichloroisocyanuric acid, 1,3 ,5-tris(2-hydroxyethyl)triazine-2,4,6-trione, hexamethylenentetramine.melam cyanurate, melem cyanurate and melon cyanurate.

22. (previously presented) An IOH according ~~toclaim 18~~ to claim 1, in which the organic component is a derivative of phosphoric acid or boric acid.

23. (Canceled).

24. (previously presented) An IOH according to claim 1, in which the ionic organic component is used in combination with other ionic compounds which are capable of improving compatibility and dispersion between the inorganic and organic components.

25. (original) An lOH according to claim 24, in which the other ionic compound is an amphiphilic molecule that incorporates a hydrophilic ionic group along with hydrophobic alkyl or aromatic moieties.

26. (previously presented) An IOH according to anyone of the preceding claims claim 1, which further comprises one or more coupling reagents.

27. (Currently amended) An IOH according to claim 26, in which the coupling reagent is selected from an ~~9rganically~~ organically functionalised silane, zirconate and titanate.

28. (original) An IOH according to claim 27, in which the silane coupling reagent is tri-alkoxy, acetoxy or halosilanes functionalised with amino, epoxy, isocyanate, hydroxyl, thiol, mercapto andlor methacryl reactive moieties or modified to incorporate functional groups based on triazine derivatives, long chain alkyl, aromatic or alkylaromatic moieties.

29. (Withdrawn) A method for the preparation of the IOH defined in claim 1, which comprises mixing components (i) and (ii) or constituents thereof in one or more steps.

30. (Withdrawn l) A method according to claim 29, in which mixing is achieved using melt, solution or powder processing.

31. (Withdrawn, previously presented) A method according to claim 29, in which the mixing is achieved using solution processing.

32. (Withdrawn, previously presented) A method for using the IOH defined in anyone of claims 1 to 28 claim 1 as a fire resistant material.

33. (Withdrawn, previously presented) A fire resistant formulation which comprises:
(i) the IOH defined in claim 1; and
(ii) one or more flame retardants.

34. (Withdrawn) A formulation according to claim 33, in which the flame retardant is selected from phosphorus derivatives, nitrogen containing derivatives, molecules containing borate functional groups, molecules containing two or more alcohol groups, molecules which endothennically release non-combustible decomposition gases and expandable graphite.

35. (withdrawn) A formulation according to claim 34, in which the phosphorus derivatives are selected from melamine phosphate, dimelamine phosphate, melamine polyphosphate, ammonia phosphate, ammonia polyphosphate, pentaerytbritol phosphate, melamine phosphite and tripheny lphosphine.

36. (withdrawn, previously presented) A formulation according to claim 34, in which the nitrogen containing derivatives are selected from melamine, melamine cyanurate, melamine phthalate, melamine phthalimide, melam, melem, melon, melam cyanurate, melem cyanurate, melon cyanurate, hexamethylene tetraamine, imidazole, adenine, guanine, cytosine and thymine.

37. (withdrawn, previously presented) A formulation according to claim 34, in which the molecules containing borate functional groups are selected from ammonia borate and zinc borate.

38. (withdrawn, previously presented) A formulation according to claim 34, in which the molecules containing two or more alcohol groups are selected from pentaerytbritol, polyethylene alcohol, polyglycols and carbohydrates.

39. (withdrawn, previously presented) A formulation according to any claim 34, in which the molecules which endothermically release non-combustible decomposition gases are selected from magnesium hydroxide and aluminum hydroxide.

40. (withdrawn, previously presented) A method for the preparation of the fire resistant formulation defined in claim 33, which comprises mixing the following components or

constituents thereof in one or more steps:
(i) an expandable or swellable layered inorganic component: and
(ii) an organic component including at least one ionic organic component and one or more neutral organic components which are intercalated between and/or associated with the layer(s) of the inorganic component.the ionic or neutral organic components being capable of decomposing or subliming endothermically, and/or releasing volatiles with low combustibility on decomposition and/or inducing charring of organic species during thermal decomposition or combustion.

41. (withdrawn) A method according to claim 40, in which mixing is achieved using melt, solution or powder processing.

42. (withdrawn, previously presented) A method according to claim 40, in which the mixing is achieved using melt processing in a twin screw extruder or batch mixer; or powder processing using a high shear powder mixer or milling procedures.

43. (withdrawn, previously presented)) A polyamide fire resistant formulation which comprises either:
(A) (i) the IOH defined in claim 1; and
(ii) a polyamide based matrix; or
(B) (i) a fire resistant formulation defined in comprising the IOH defined in claim 1 and one or more flame retardants; and
(ii) a polyamide based matrix.

44. (withdrawn) A formulation according to claim 43, in which the polyamide based matrix comprises generic groups with repeat units based on amides selected from Nylon4, Nylon6, Nylon7, Nylon11, Nylon12, Nylon46, Nylon66, Nylon 68, Nylon610, Nylon612 and aromatic polyamides and co-polymers, blends or alloys thereof.

45. (withdrawn, previously presented) A fonnulation according to claim 43, in which the

polyamide based matrix is selected from Nylon12, Nylon6 and Nylon66 and co-polymers, alloys or blends thereof.

46. (withdrawn, previously presented) A formulation according to claim 43, which further comprises one or more additives.

47. (withdrawn) A formulation according to claim 46, in which the additives are selected from polymeric stabilisers; lubricants; antioxidants; pigments, dyes or other additives to alter the materials optical properties or colour; conductive fillers or fibers; release agents; slip agents; plasticisers; antibacterial or fungal agents; and processing agents.

48. (withdrawn) A formulation according to claim 47, in which the polymeric stabiliser is a UV, light or thermal stabilizer.

49. (withdrawn, previously presented) A formulation according to claim 47, in which the processing agents are selected from dispersing reagents, foaming or blowing agents, surfactants, waxes, coupling reagents, rheology modifiers, film forming reagents and free radical generating reagents.

50. (withdrawn, previously presented) A formulation according to claim 43, in which the polyamide based matrix is Nylonl2, Nylon6 and/or Nylon66; the IOH is montmorillonite or hectorite modified with melamine hydrochloride andlor melamine cyanurate hydrochloride andlor melamine and/or melamine cyanurate; and the flame retardant is melamine cyanurate and/or magnesium hydroxide; and the additive is a processing agent and/or a polymeric stabiliser.

51. (withdrawn, previously presented) A formulation according to claim 46, in which the polyamide based matrix is present in an amount of about 45 to about 95% w/w, the IOH is present in an amount less than about 25% w/w and the flame retardant and/or additives are present in an amount less than about 30% w/w.

52. (withdrawn, previously presented) A formulation according to claim 46, in which the polyamide based matrix is present in an amount greater than about 75% w/w, the IOH is present in an amount less than about 3% w/w, the melamine cyanurate flame retardant is present in an amount of about 11 to about 15% w/w and additives are present in an amount of about less than about 4% w/w.

53 . (withdrawn, previously presented) A formulation according to claim 46, in which the polyamide based matrix is present in an amount greater than about 75% w/w, the IOH is present in an amount less than about 3% w/w, the melamine cyanurate flame retardant is present in an amount of about 11 and about 15% w/w, magnesium hydroxide flame retardant present in an amount of about 1 and about 5% w/w and additives are present in an amount less than about 4% w/w.

54. (withdrawn, previously presented) A method for the preparation of the polyamide fire resistant formulation defined in claim 43, which comprises dispersing an inorganic-organic hybrid (IOH) comprising:
(i) an expandable or swellable layered inorganic component: and
(ii) an organic component including at least one ionic organic component and one or more neutral organic components which are intercalated between andlor associated with the layer(s) of the inorganic component the ionic or neutral organic components being capable of decomposing or subliming endothermically. and/or releasing volatiles with low combustibility on decomposition and/or inducing charring of organic species during thermal decomposition or combustion and optionally including one or more fire retardants into the polyamide based matrix in one or more steps.

55. (withdrawn) A method according to claim 54, in which at least some of the components are ground prior to mixing.

56. (withdrawn) A method according to claim 55, in which the components are ground to a particle size less than about 200 microns.

57. (withdrawn, previously presented) A method according to claim 55, in which dispersion is achieved using melt, solution or powder processing.

58. (withdrawn, previously presented) A method according to claim 55, in which the dispersion is achieved using melt processing in a single or twin screw extruder, batch mixer or continuous compounder.

59. (withdrawn, original) A method according to claim 58, in which the melt processing is conducted in a twin screw extruder.

60. (withdrawn, previously presented) A method according to claim 54, in which the dispersion occurs at a sufficient shear rate, shear stress and residence time to disperse the IOH at least partially on a nanometer scale.

61. (withdrawn, previously presented) A fire resistant article or parts thereof which is composed wholly or partly of the IOH as defined in claim 1.

62. (withdrawn) A fire resistant article or parts thereof as defined in claim 61, which is used in transport, building, construction, electrical or optical applications.

63. (withdrawn) A fire resistant article or parts thereof as defined in claim 62, in which the transport application is air, automotive, aerospace or nautical.

64. (withdrawn, previously presented) A fIre resistant article or parts thereof as defined in claim 61, which is a hollow article or sheet.

65. (withdrawn, previously presented) A fire resistant article or parts thereof as defined in claim 61 which is selected from pipes, ducts, fabric, carpet, cables, wires, fibres, Environmental control systems, stowage bin hinge covers, cable trays, ECS duct spuds, latches, brackets, passenger surface units and thermoplastic laminate sheet.

66. (withdrawn, previously presented) A fire resistant hollow article or parts thereof which is composed wholly or partly oflhe fire resistant formulation defined in claim 52 and manufactured by rotational moulding or extrusion.

67. (withdrawn, previously presented) A fire resistant fibre, fabric, carpet or parts thereof which is composed wholly or partly of the fire resistant formulation defined in claim 52 and manufactured by melt spinning or extrusion.

68. (withdrawn, previously presented) A fire resistant article or parts thereof which is composed wholly or partly of the formulation defined in claim 52 and manufactured by sintering.

69. (withdrawn, previously presented) A fire resistant article or parts thereof which is composed wholly or partly of the fire resistant formulation defined in claim 52 and manufactured by injection or compression moulding.

70. (canceled)

71. (canceled)